REMARKS

This Amendment is filed in response to the Office Action mailed on February 21, 2006. All objections and rejections are respectfully traversed.

Claims 1 to 12 and 14 to 44 are currently pending.

Claims 34 to 44 are added to better claim the invention.

Claim Objections

At page 2 of the Office Action, claims 16 and 21 were objected to as being improper dependent claims for failing to further limit the subject matter of the claim.

Claims 16 and 21 are amended and believed allowable over the objection. Claims 34 and 35 recite features originally in claims 16 and 21.

Claim Rejections – 35 USC § 101

At page 2 of the Office Action, claim 13 was rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter.

Claim 13 is cancelled, therefore the rejection is moot.

<u>**Claim Rejections – 35 USC § 102**</u>

At page 3 of the Office Action, claims 1-5, 22, 23 and 31-33 were rejected under

35 U.S.C. §102 as being anticipated by Patterson et al, "A case for Redundant Arrays of

Inexpensive Disks (RAID), June 1988, hereinafter Patterson.

The present invention, as set forth in representative claim 1, comprises in part:

> 1. A system adapted to distribute redundant information across disks of an
> array, the system comprising:
> a storage operating system configured to invoke storage operations
> executed by a storage system, the storage operating system further config-
> ured to manage storage of information, including the redundant informa-
> tion and data, on blocks of the disks in response to disk access operations,
> the storage operating system including a storage module adapted to com-
> pute the redundant information in response to placement of the data in
> stripes across the disks, *the storage operating system maintaining at least*
> *one unallocated block per stripe for use by the storage module to store*
> *the computed redundant information, wherein the at least one unallo-*
> *cated block used to store the redundant information is located in any*
> *disk and wherein the location of the at least one unallocated block use to*
> *store the redundant information can change over time.*

By way of background, Patterson describes a fifth level RAID system. RAID

level 5 assigns parity in a fixed pattern across the disks usually a rotating pattern. One

problem with RAID 5 is that it is hard to add new disks because of the fixed parity pla-

cement.

Applicant respectfully urges that Patterson does not describe Applicant's claimed

novel *the storage operating system maintaining at least one unallocated block per*

stripe for use by the storage module to store the computed redundant information,

wherein the at least one unallocated block used to store the redundant information is

located in any disk and wherein the location of the at least one unallocated block use to

store the redundant information can change over time. In further detail, Applicant's

invention allows *the at least one unallocated block use to store the redundant informa-*

tion can change over time. Applicant's invention stores parity data in the unallocated

blocks in a stripe. The unallocated blocks can change with each stripe and do not follow

a constant pattern. The operating system in Applicant's invention determines which

blocks are unused in a stripe and reserves the unused blocks for parity. This causes the

parity to be stored in *the at least one unallocated block used to store the redundant in-*

formation is located in any disk. In sharp contrast, Patterson describes a RAID 5 system

where parity information is stored in a rotating pattern across the disks changing after

each stripe. There is no disclosure in Patterson of determining an unallocated block and

storing parity information in that block.

Furthermore, in Applicant's application, the specification points out the problem

of RAID 5, which states:

> "A RAID-5 level implementation would do a better job of distributing
> read and write load across the disks, but it has the disadvantage that the
> <u>fixed pattern of parity placement makes it difficult to add disks</u> to the ar-
> ray." (emphasis added) (Spec. page 5, lines 5-8).

Patterson states the problem, specifically on page 114, figure 4, (b) legend states:

> "The sectors are shown below the disks, with the check information and
> data spread evenly through all the disk."

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Patterson describes the data and check information is evenly spread across all disks shows as pointed out as a disadvantage in Applicant's background section stating that the fixed pattern makes the system difficult to adjust. Applicant's invention selects the unallocated blocks of each stripe to store redundant information instead of a set pattern as described in RAID 5.

Accordingly, Accordingly, the Applicant respectfully urges that Patterson is legally insufficient to anticipate the present claims under 35 U.S.C. §102 because of the absence of the Applicant's claimed novel *the storage operating system maintaining at least one unallocated block per stripe for use by the storage module to store the computed redundant information, wherein the at least one unallocated block used to store the redundant information is located in any disk and wherein the location of the at least one unallocated block use to store the redundant information can change over time.*

Claim Rejections – 35 USC § 103

At page 6 of the Office Action, claims 6-8, 11, 12, and 26 were rejected under 35 U.S.C. §103 as being unpatentable over Patterson, in view of Baylor et al, US Patent No. 5,862,158, hereinafter Baylor.

At page 9 of the Office Action, claims 14, 15, 18-20, and 27 were rejected under 35 U.S.C. §103 as being unpatentable over Patterson, in view of Baylor, and in further view of Stallmo et al., US Patent No. 5,657,468, hereinafter Stallmo.

At page 12 of the Office Action, claims 9 and 10 were rejected under 35 U.S.C. §103 as being unpatentable over Patterson, in view of Baylor, and in further view of Ulrich, US Patent Application publication No. 2002/0124137, hereinafter Ulrich.

At page 13 of the Office Action, claims 16, 17 and 21 were rejected under 35 U.S.C. §103 as being unpatentable over Patterson, in view of Baylor, and in further view of Stallmo, and in further view of Wiencko et al., US Patent No. 6,557,123, hereinafter Wiencko.

Applicant respectfully notes that claims 6-12, 14-21, 26 and 27 are dependent claims that depend from independent claims believed to be in condition for allowance. Accordingly, claims 6-12, 14-21, 26 and 27 are believed to be in condition for allowance.

In the event that the Examiner deems personal contact desirable in the disposition of this case, the Examiner is encouraged to call the undersigned attorney at (617) 951-3067.

All independent claims are believed to be in condition for allowance.

All dependent claims are believed to depend from allowable independent claims.

The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account

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Respectfully submitted,

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